
Sissejuhatus infotehnoloogiasse

Ülevaade: teemad 1990-2007

■ Riistvara:

- Spetsiaalprotsessorid: sünd ja surm. Erand: 3D graafikaprotsessorid 1996...
- IBM PC, Apple Macintosh, Sun workstations & servers
- Pihuarvutid: Apple Newton, Palm. MS Pocket PC opsüsteem.
- Mobla/pihuarvutite/... sümbioos: Treo, Blackberry, iPhone, ...

■ Tarkvara:

- Microsoft muutub IBM PC domineerivaks tarkvara-arendajaks
- Microsoft ja IBM tülli: Windows NT vs OS/2
- SQL andmebaasikeel ja andmebaasirakendused mainstreamis
- Gnu / Linux ja vabavara-liikumine. Linux, Apache, MySQL/Postgresql jms.

■ Internet massidesse: html ja brauser

- Varasem uudistesüsteem (80-datel: USENET). Internet ülikoolides.
- 1990 Tim-Berners lee leiutab HTML-i ja kaasaegse brauseri
- Netscape viib brauseri massidesse.
- WWW muudab interneti mainstream-tehnoloogiaks.
- Microsoft haarab Netscape brauseriosa, Netscape käivitab Mozilla
- 2000 kümnendi teine pool: Google, javascript oluliseks, mashups

■ Börsimull:

- USA börsid liiguvad 90 aastate algusest tempokalt üles
- 1990 aastate lõpul lähevad interneti- ja tarkvarafirmade aktsiad ülikalliks
- 2001 aastal murrang: börs langeb kiiresti kuni 2002 sügis: sel hetkel tehnoloogiaaktsiad 96 tasemel, Dow Jones (klassikaliste suurfirmade aktsiad) 97 aasta tasemel.

- 2003 algus: börsilangus lõppenud, jätkub harilik tõus

1989-90: Rahvusvaheline võrguots Eestis: FIDONET

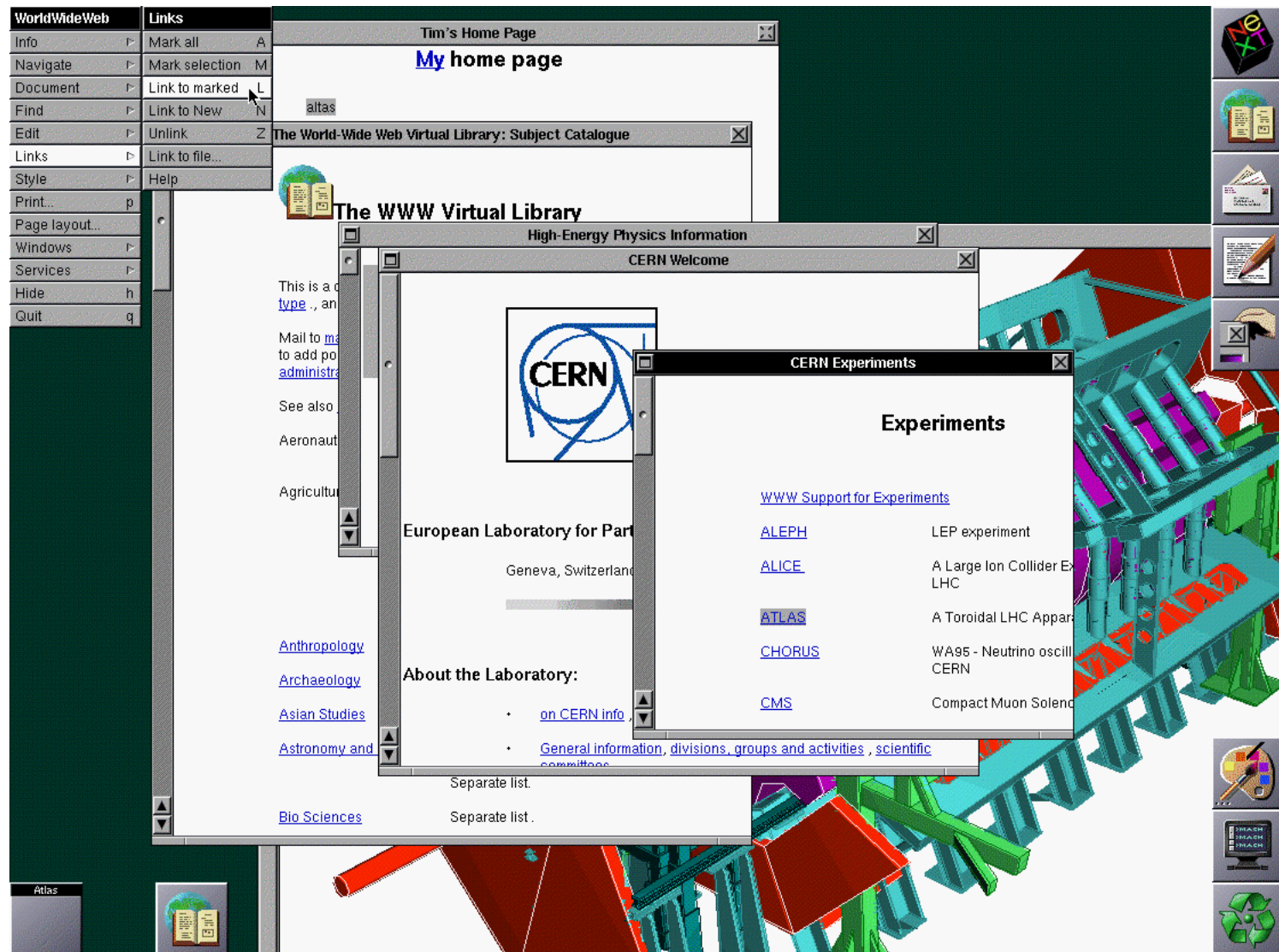
- 1989 detsembri lõpus panid Andrus Suitsu ja Tarmo Soodla käima Opus-e nimelise P.O.Box-i.
- 1990 aasta kevadel lülitus Eesti **FIDONET** Soome kaudu ülemaailmsesse FIDO-võrku, ning sama aasta sügiseks oli Eestis juba sedavõrd palju FIDONET-i huvilisi, et Eesti sai omaette FidoNeti regiooni staatuse (R49).

1990: HTML, http and the browser are born

- **The World Wide Web was born** when **Tim Berners-Lee**, a researcher at CERN, the high-energy physics laboratory in Geneva, developed HyperText Markup Language.
- **HTML**, as it is commonly known, allowed the Internet to expand into the World Wide Web, using specifications he developed such as **URL** (uniform resource locator) and **HTTP** (hypertext transfer protocol).
- Berners-Lee based the World Wide Web on Enquire, a hypertext system he had developed for himself, with the aim of allowing people to work together by combining their knowledge in a global web of hypertext documents.
- With this idea in mind, Berners-Lee designed **both the first World Wide Web server and browser -- available to the general public in 1991.**
First web server address: info.cern.ch
- Berners-Lee founded the **W3 Consortium**, which coordinates World Wide Web development. **www.w3c.org**. Active in **semantic web** project



1990 :TBL browser, runs on NeXT



1990 WWW taustaks: mis oli ja mis ei

- **Oli selleks ajaks:**
 - Hulk aega olemas olnud internet
 - Email, ftp, gopher ja muud failivahetussüsteemid internetis
 - Apple'i HyperCard (umbes nagu html, aga ühe masina piires)
- **Ja olid varased ideed, mida ei realiseeritud:**
 - Vannevar Bushi ideed aastast 1945, Doug Engelbarti klassikaline demo 1960-datest (hiir, aknad, koostöö üle võrgu)
 - Ted Nelsoni poolik projekt Xanadu (aastast 1965)
- **Berners Lee** aga **programmeeris ideed praktiliselt kokku**, tehes lihtkasutajate jaoks väga mugava süsteemi. HTML on väga lihtne!

1990: GNU UNIX almost complete

- 1990, the **GNU system was almost complete**; the only major missing component was the **kernel**.
- It was decided to implement the kernel as a collection of server processes running on top of **Mach**. Mach is a microkernel developed at Carnegie Mellon University and then at the University of Utah. The start of development was delayed as people waited for Mach to be released as free software, as had been promised.

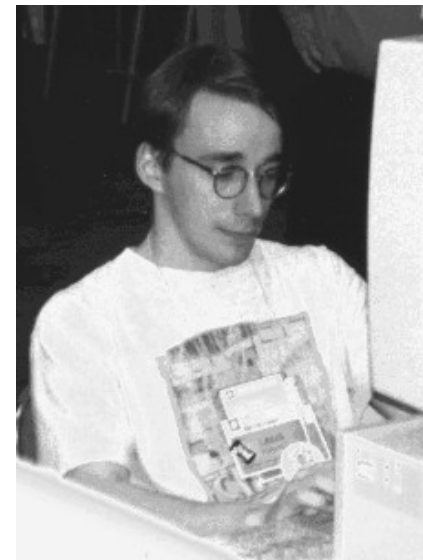
1990: MS and IBM end cooperation

- Microsoft shipped **Windows 3.0** on May 22.
- IBM and Microsoft end cooperative work on operating systems, dividing up work-to-date between them, in a series of cross-licensing agreements.
 - Microsoft will work on Windows, DOS, and a portable version of OS/2.
 - IBM will continue development of 16-bit and 32-bit versions of OS/2.

1990: Internetiotsake Eestis: e-post ja USENET

- Tampere tehnikaülikoolist laenuks saadud moodemi **Robotics Courier V.32** abil panid Küberneetika Instituudi teadurid Aleksander Shmundak, Mari Kõpp ja Leonid Tomberg käima regulaarse ühenduse oma instituudi ja soome UNIXI-kasutajate seltsi (FUUG) masina vahel.
- Küberneetika Instituudi arvuti **helistas iga poole tunni tagant Soome arvutisse ja saatis edasi ning võttis vastu vahepeal saabunud e-teated (põhiliselt e-posti).**
- Ca 400 rubla eest kuus said Eesti-poolsed kliendid ennast oma moodemi abil Küberneetika Instituudi arvuti külge haakida ning samuti e-posti saata.
- Küberneetika instituudi e-posti aadressi lõpus oli .su, mis tähendas mõistagi NSVL-i.

- Linus Torvalds, a student at the University of Helsinki in Finland, starts working as a hobby on **Linux**. Linus had an interest in **Minix**, a small UNIX system created by Tannenbaum, and decided to develop a system that exceeded the Minix standards. He began his work in 1991 when he released version 0.02
- Linus used both Minix and Gnu for his work: **essentially, Linux is a Minix-inspired kernel for Gnu.**



- Microsoft changes the name of OS/2 v3.0 to Windows NT.

- **Microsoft stock reaches US\$113/share**, making Bill Gates the richest man in the United States.
- In the second year of the **RS/6000** line, IBM has sold US\$2 billion worth.
- Microsoft launches its first TV advertising campaign, for Windows.
- **Microsoft buys Fox Software** for 1.36 million shares of Microsoft's common stock, valued at US\$17. million.
- **IBM ships OS/2 2.0**. It requires an Intel 386 processor, 4 MB RAM, and adds WIN-OS/2 3.0 for Windows 3.0 compatibility. Code name during development was Cruiser.
- **Microsoft ships Windows 3.1**. 1 million copies of the new and upgrade versions are sold through retail channels within the first 50 days.
- **IBM and Microsoft sign a "divorce" document**, allowing source code sharing for current versions operating systems up to September 1993.

1992: GSM mobile networks: first providers appear

- **1982** Nordic Telecom and Netherlands PTT propose to CEPT (Conference of European Post and Telecommunications) the development of a new digital cellular standard that would cope with the ever a burgeoning demands on European mobile networks.
- **1982** The European Commission (EC) issues a directive which requires member states to reserve frequencies in the 900 MHz band for GSM to allow for roaming.
- **1987** 13 operators and administrators from 12 areas in the CEPT GSM advisory group sign the charter GSM (Groupe Spéciale Mobile) MoU "Club" agreement, with a launch date of 1 July **1991**. GSM spec drafted.
- **1990** Phase 1 GSM 900 specifications are frozen. First GSM World congress in Rome with 650 Participants
- **1992 January** - First GSM network operator is **Oy Radiolinja Ab** in Finland.
- **1992 December** - 13 networks on air in 7 areas. GSM World Congress Berlin - 630 Participants

1992: Päril TCP/IP internetiotsad Eestis

- Lippmaa organiseerimisel rajas **KBFI** kaks kallist **satelliidi-**otseliini TCP/IP (päris internet) jaoks: Tallinn(KBFI)-Stockholm(KTH) ja Tartu(Biokeskus)-Stockholm.
- Ants Wõrk **Küberneetika Instituudist** organiseeris interneti-välisühenduse **kaablitpidi** Helsingisse.
- KBFI satelliidiühendus sai valmis kuu aega enne Küberneetika Instituudi kaabliühendust: Tõelise Interneti käimapaneku juures **1992. aasta märtsis** viibisid paar rootslast ja eesti poolelt Andres Bauman, Jaak Lippmaa ning Toomas Kadarpi.
- Kuivõrd KBFI uus interneti-ots sai valmis enne Küberneetika Instituudi oma, hankisid nemad Eestile Soviet Unioni .su-st erineva interneti aadressi **.ee** ja hakkasid Eesti-sisest internetti administreerima.
- Nii Küberneetika Instituudi kui KBFI-Biokeskuse ühendused elasid välisfinantsidest, ning olid ette nähtud akadeemilistele kasutajatele.

1992: Wolfenstein 3d and what happened next



sprite
ani-
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3d

- **Wolfenstein 3D** was originally released for DOS in **1992** by **ID Software**. Main authors: Carmack & Romero. It is the first popular 3D first-person shooter.
- Wolfenstein 3D is followed by **Doom**, also by ID software.
- **Quake** released **1996** by ID software.

Features support for the **3D graphics processor** called **Voodoo** by **3dfx**,



released same year. **Full 3d** in real time achieved in Quake!

- After a while, a large number of 3D games appear, assuming special **3D graphics instruction processors** on user's computers. These processors speed graphical programs up incredibly: hundreds of times
- In 2002, Nvidia buys 3dfx. **Nvidia** and **ATI** emerge as dominant 3D graphics processor makers.
- In 2006, **AMD** buys **ATI**
- **Intel** is active in low-mid-range graphics chips

- **NeXT announces that it will drop its hardware line**, to focus on becoming a larger player in the object-oriented software industry. Approximately 50,000 NeXT machines were built in total. It will lay off 330 of its 500 employees.
- Digital Equipment announces the **200-MHz Alpha 21064** processor. Sun Microsystems ships the 50-MHz Sun **SuperSPARC** processor.
- Intel introduces the **Pentium processor**. It uses 32-bit registers, with a 64-bit data bus, giving it an address space of 4 GB. It incorporates 3.1 million transistors, using 0.8-micron BiCMOS technology. Speeds are 60-MHz (100 MIPS) and 66-MHz (112 MIPS). Prices are US\$878 (60-MHz) and US\$964 (66-MHz).
- Sun Microsystems, Novell, Hewlett-Packard, IBM and the Santa Cruz Operation announce that they will work together toward a **unified UNIX operating system standard**.
- **Motorola** Corp. ships the first **PowerPC 601 chips**. The processors use 2.8 million transistors, with 3 execution units.
- Microsoft reports that there are 25 million licensed users of Microsoft Windows.

- Apple Computer introduces the **Newton MessagePad 100** personal digital assistant at Macworld Expo, in Boston's Symphony Hall. It features 640KB RAM, 3MB of ROM storing applications and the operating system (Newton Intelligence), a low-voltage 20-MHz 32-bit ARM 610 microprocessor, 240x336 resolution (85 dpi) 2.8 x 4-inch LCD screen, one PCMCIA Type II expansion socket, data transfer of 9600bps, and runs on four AAA batteries. **50,000** units sell in the first 10 weeks, but only **80,000** are sold during the product's life.



1993: Berners-Lee süsteemi edasiarendus

NCSA-s

- **First publicly available popular browser**, free to download, runs on several UNIX workstations:

NCSA **Mosaic v1.0** is released.

- **NCSA**: National Center for Supercomputing Applications
- **MS Internet Explorer “about” in 2002 says**: “Based on NCSA Mosaic. NCSA Mosaic(TM); was developed at the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign”.

1994: NCSA www-meeskonnast tekib Netscape

- Silicon Graphics co-founder James Clark leaves to start Mosaic Communications. Mosaic soon renamed to Netscape.
- **Mosaic Communications releases Netscape Navigator 1.0**, a world-wide web browser.



Jim Clark, on what motivates him as an entrepreneur:

"Something begins to annoy me and disturb me...and then I want to try to find a solution to it."



- Asutajad: **Clark** ja **Andreessen**

Clark invested \$4 millions.

Andreessen invested source code and competence and team.

- Microsoft offers Netscape US\$1 million to license Netscape's browser code. Netscape refuses.

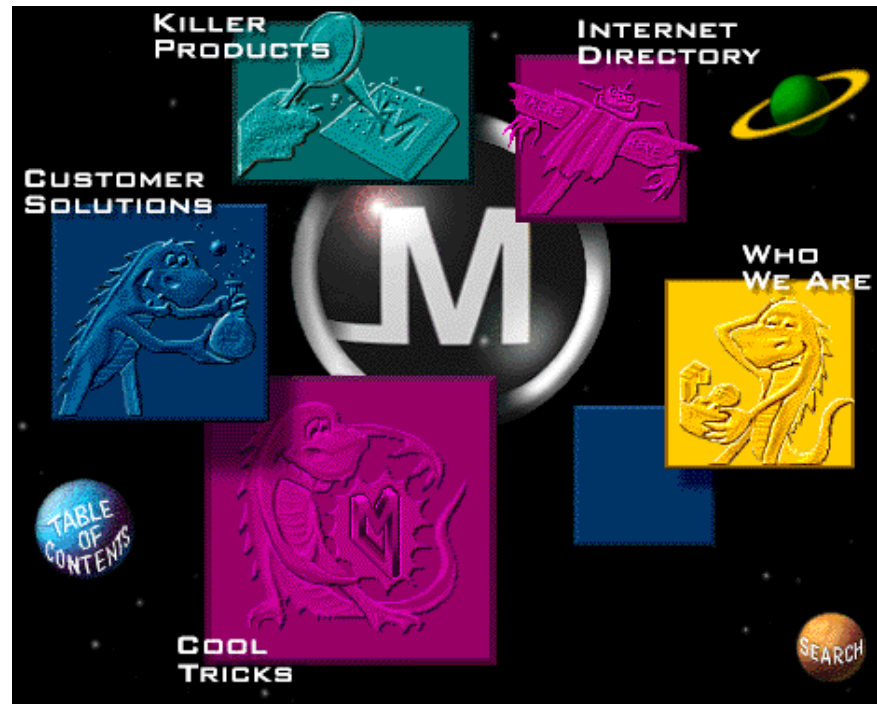
1994: Netscape message on USENET

From: [Marc Andreessen \(marca@mcom.com\)](mailto:marca@mcom.com)
Subject: Here it is, world!
View: [Complete Thread \(30 articles\)](#) [Original Format](#)
Newsgroups: [comp.infosystems.www.users](#),
[comp.infosystems.www.providers](#), [comp.infosystems.www.misc](#),
[comp.infosystems](#)
Date: 1994-10-13 06:51:10 PST

Mosaic Communications Corporation is making a public version of Mosaic Netscape 0.9 Beta available for anonymous FTP. Mosaic Netscape is a built-from-scratch Internet navigator featuring performance optimized for 14.4 modems, native JPEG support, and more. You can FTP Mosaic Netscape 0.9 Beta from the following locations:

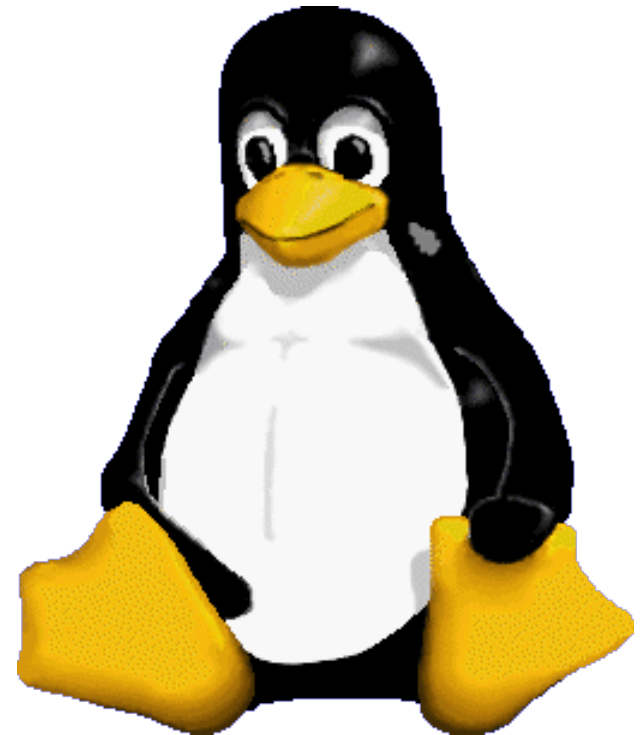
.....

Mosaic and Netscape site logos 1994



1994: GNU/Linux version 1.0 and freeware BSD-s

- **A freeware version of UNIX BSD branch:** 4.4 BSD Lite at Berkeley
- Linus Torvalds releases **version 1.0 of the Linux Kernel.**
- **NB!** Freeware BSD-s and Linux are completely separate projects to create freeware UNIX-es



- Dr. Thomas R. Nicely of Lynchburg College notes that the Pentium processor sometimes produces **flawed floating-point results**, yielding only 4-8 decimals of precision.
- **IBM and Motorola announce the 100-MHz PowerPC 604 processor.** The 604 has one floating-point unit, and three integer units. Two of the integer units perform single clock cycle instruction, while the other is used for integer multiplication and division. The processor uses 3.6 million transistors. Internally, 64 bits. Based on RISC ideas.
- Apple starts using PowerPC instead of older Motorola processors. First such Macintoshes are called “PowerMac”-s.

1995: Netscape börsile, WWW mainstream

- **Netscape: börsile 5 miljonit aktsiat** alghinnaga \$28. Aktsiahind kasvab ühe päevaga \$75-le. 1996 lagi: **179\$**. 1996 lõpp on hind ca \$40. Enne ostmist AOL poolt maksab Netscape stock ca **20\$**.
- Microsoft asks Netscape Communications to agree to not develop Netscape Navigator for Windows 95 and successors. Netscape refuses.
- Free **Apache web server** released, using NCSA httpd 1.3 as a base.

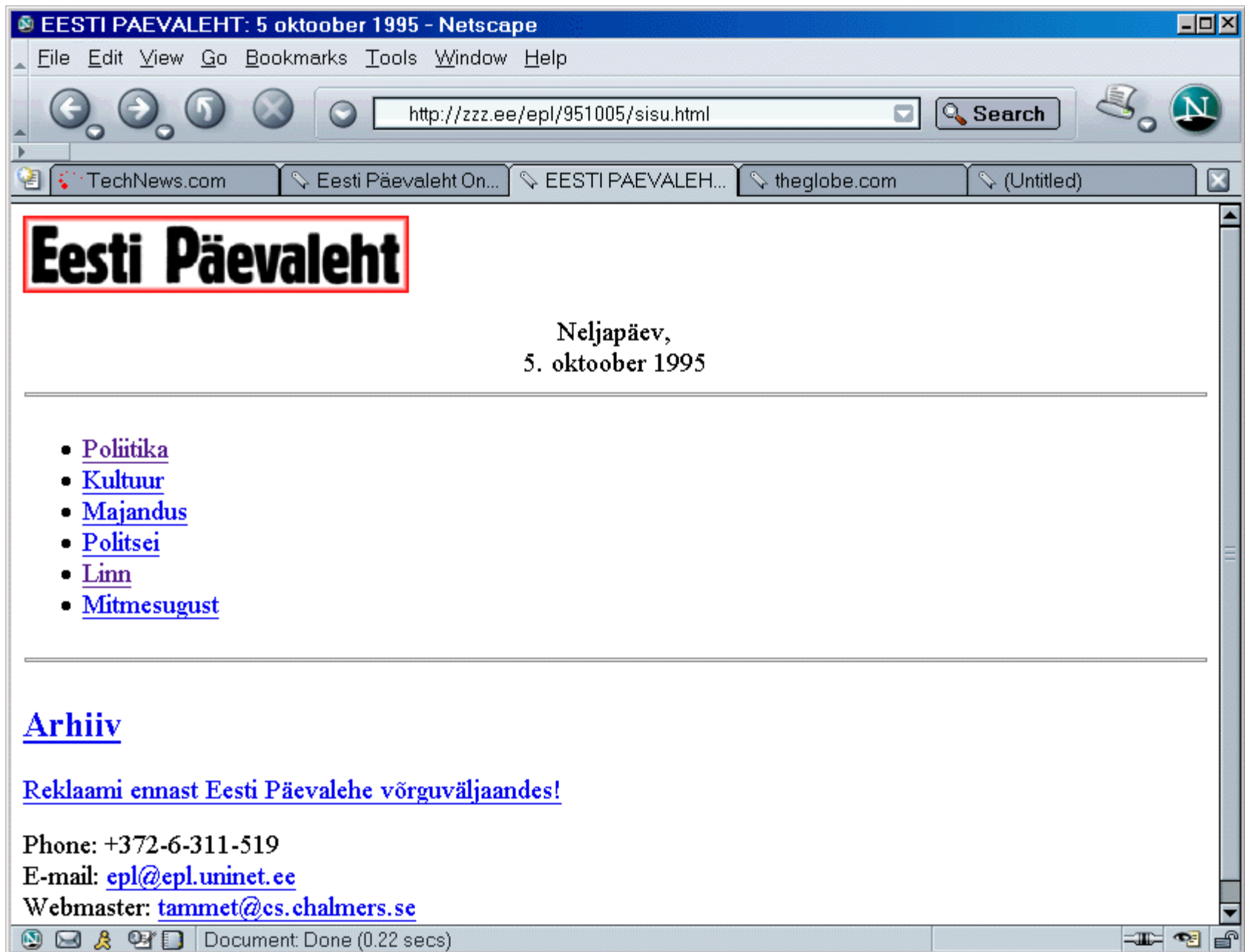
History: first there was the Berners-Lee built server at Cern. Then NCSA people created their own server. Rob McCool writes:

> How did you first get involved in the NCSA HTTPd project, and who else worked on that with you?

It was largely me, Eric Bina did some work on group annotations, and I took some ideas/code/etc. from a number of people across the Web. If I tried to name them I'd probably forget a lot of people. I first got involved because Marc wanted to have a small, simple server that people could use with Mosaic. He felt the CERN server was too large and complex, and that something small and easy to understand would facilitate more widespread adoption.

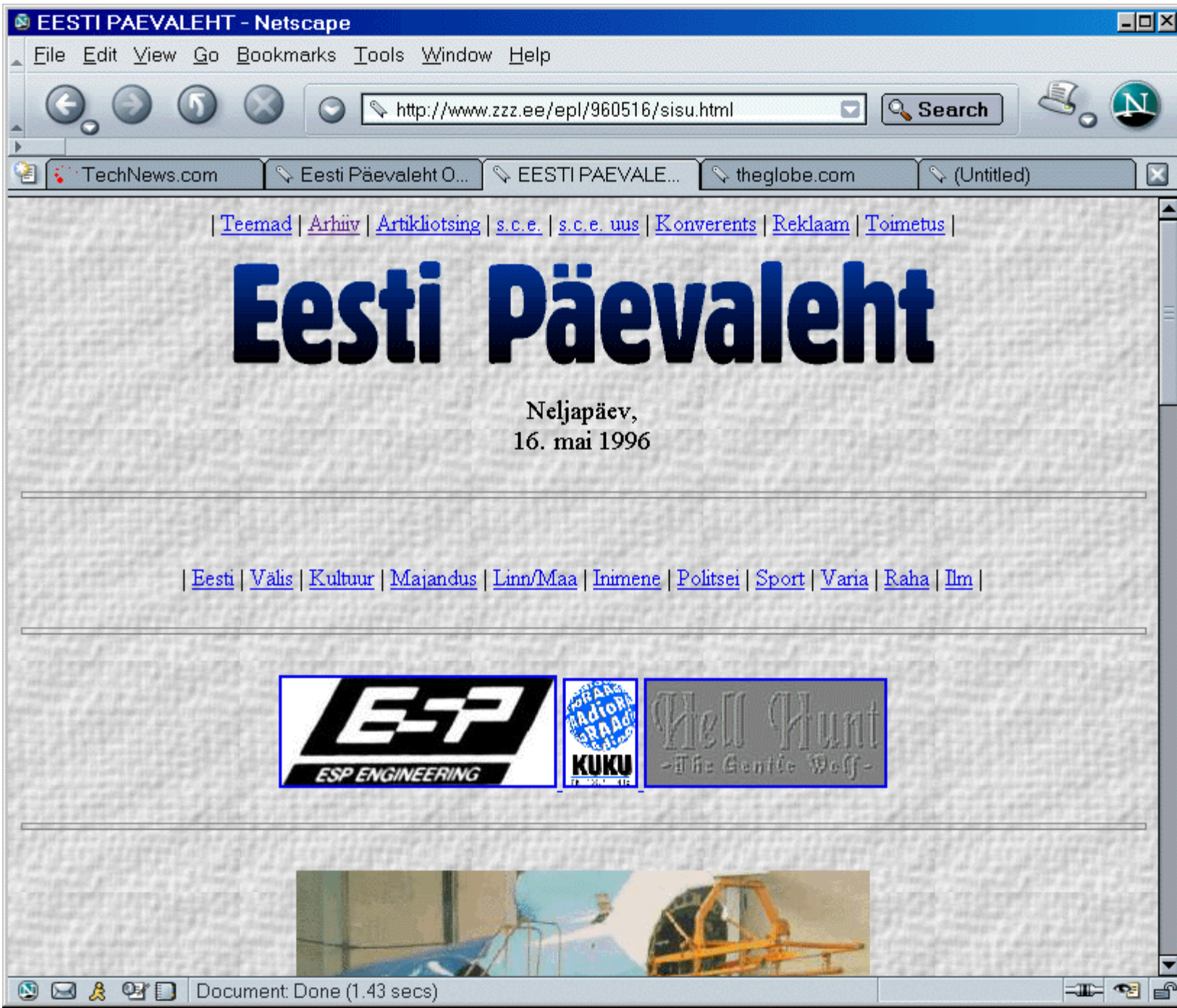
1995: Eestis esimene päevaleht internetis

- **Eesti päevaleht.** <http://www.zzz.ee/epl/>
- Esimene number: 5. oktoober 1995
- Käivitamise osalised:
 - Tanel Tammet: pushimine & tegelik igapäevane avaldamine
 - Marek Strandberg: üks EPL omanikke, aktiivselt poolt
 - Ott Köstner: www.zzz.ee üks omanik ja põhihaldaja
 - Kalle Muuli: peatoimetaja, oli rõõmsalt nõus.



Postimees võrgus: 1 detsember 1995





EESTI PAEVALEHT - Netscape

File Edit View Go Bookmarks Tools Window Help

http://www.zzz.ee/epl/971105/sisu. Search

TechNews.com Eesti Päevaleh... EESTI PAEVA... theglobe.com (Untitled)


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TEISIPÄEV
4. NOVEMBER
1997

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Eesti Päevaleht



RIIGI TEINE MEES LÕIKUSLAUAL.
Riigikogu esimehe Toomas Savi põlvest eemaldati kolm kõhretükikest. "Tunnen ennast väga hästi. Öhtul lähen koju ja neljapäeval tahaks taas Riigikogu juhatada," ütles Savi pärast operatsiooni. Tallinnas Meremeeste haiglas tehtud põlvelõikus oli Savile juba kolmas. Helsingi Eira haigla peaarsti Esko Kaartineni operatsioonil assisteerinud doktor Kaidu Meitern kinnitas, et seekord tehti Savi sportimisel viga saanud põlv päris põhjalikult korda ja niipea pole uut operatsiooni oodata.

▶ **Päevalehe võrguväljaanne uueneb!**

Hea lugejal

Koos Eesti Päevalehe paberväljaandega uueneb ka meie

TTÜ 2

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Eesti Päevaleht

külastajat
alates 15.01.98

ESMASPÄEV, 4. JAANUAR 1999

- Eesti uudised
- Välisuudised
- Juhtkiri
- Arvamus
- Majandus
- Elu
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ARTIKLIOTSING

Sisesta otsitav sõna

Otsi

Otepää korjas tippudele lume kokku

URMO KÜBAR

Üleeile lõpetasid sadakond Kuperjanovi pataljoni ja piirivalve ajateenijat Otepää suusarajale kunstlume kandmise.

Sõdurite abiga taastasid Otepää suusavõistluse korraldajad kolme päevaga jõulupühade järel üles sulanud suusarajad, kus homme algab suusatamise maailmakarikavõistluste (MK) etapp.



Martinsen tuli Shmigunilt revanshi võtma

GUNNAR PRESS

Maa ilma karikasarja liider Bente Martinsen kinnitas eile Tallinna Lennujaamas, et saabus Kristina Shmigunilt Suverullil saadud kaotuse eest revanshi võtma.

- Toimetus
- Tellimine
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- EPL arvudes
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- Arhiiv
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Parima tulemuse
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Eesti Päevaleht Online - Netscape

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http://www.epl.ee/

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TechNews.com

Eesti Päevaleht O...

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theglobe.com

(Untitled)

Personalitsing
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YOU DO YOU ME?

inpoc

Telli

Eesti Päevaleht

Eratelefonid
Firmade telefonid
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TEISIPÄEV 8. oktoober 2002 [09:39]

Hansapank

Head mõtted saavad alati teoks

online@epl.ee | Uudisteriba | Otsing | Kõik uudised | Kontakt | Reklaam | Tellimine | Uudistelist

Rubriigid

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Ajalehe arhiiv

Eesti Päevaleht

Rahvuse skandinaavis erastaja
Angoni valitsus Hollandis

Teemad

Arkaadia

Kogu info Eestist pressiti superteose 800 leheküljele (6)

Entsüklopeedia sarjas tuleb homsest müügile suurejooneline koguteos "Eesti üld", mis annab Eestist faktirohke ja tervikliku ülevaate, alates jääajast kuni selle aasta alguseni.
[Loe edasi](#)
(00:00) REPLIIK: Ühest ei piisa (3)

Toompea piirab hüvesid (17)

Avalikkuse survele esitasid Mõõdukad ja Rahvaliit eile esimestena eelnõud, mis vähendavad oluliselt riigikogu liikmete lisatasusid ja garantiisid.
[Loe edasi](#)
(00:00) Kopsakad sõiduarved (3)
(00:00) Riigikokku ehitati veel üks saun (13)
(00:00) Rahvasaadikute suured soodustused kinkis viimane ülemnõukogu (3)

Uudised

Nädal pildis

Fotod: tramm sõitis veoautole küljepealt sisse

Esmaspäeval kell 15.25 sõitis veoauto Põhja puiesteele trammile ette ja toimus liiklusõnnetus, vigastatuid õnneks ei olnud. Pille-Riin Pregeli fotod.

Eesti

Ülevaade möödunud ööpäeva kriminaalkroonikast

Kuum

Putini juubel kujunes kasvava isikukultuse kulminatsiooniks (3)

Kremlis poole on teel kümned tuhandet postkaardid õnnesoovidega, samas kui poliitikud, äri- ja kultuuri-inimesed ning

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1995: Windows 95

- **Microsoft releases Windows 95.** More than 20,000 retail stores offer copies for sale.
- Windows 95 sports a GUI interface somewhat similar to Apple Macintosh.
- Microsoft prepares for support calls, with 1600 people staffing tech support lines. 1 million copies of the new and upgrade versions are sold through retail channels within the first 4 days.
- One month after the release of Windows 95, an estimated 7 million copies have been sold to end-users.
- Microsoft releases **Microsoft Internet Explorer 1.0.**
- Microsoft introduces **Microsoft Office 95.**

1995: Pixar's Toy Story

- First full-length feature film done entirely with 3-D animation.
- Pixar was created by Jobs several years before.



- **Be Inc.** introduces the BeBox

1990 saw Jean Louis Gassée and Steve Sakoman leave their posts at Apple Computer and start working towards their dream of creating a new kind of computer; one that would inspire both users and developers. In late 1990, more Apple refugees, including Erich Ringwald and Bob Herold, joined Gassée and Sakoman at their as yet un-named company.

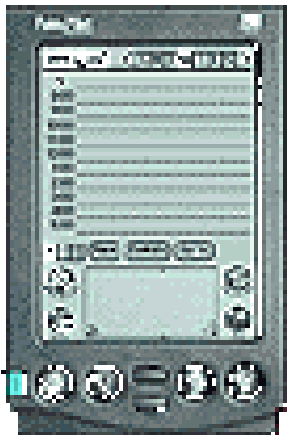
In **January 1997**, Be announced that it was ceasing production of the BeBox, and would instead focus its efforts on further developing the **BeOS**. Roughly 1800 BeBoxen had been manufactured.

- Borland International ships **Borland Delphi**.
- Sun Microsystems announces sample availability of the 64-bit UltraSPARC microprocessor.
- **IBM buys Lotus Development** for US\$3.5 billion in cash.
- **Sun** brings out the portable **Java language and associated libraries**. Java is initially used for writing small applets in HTML web pages, but after a while focus shifts to “ordinary programs” without browsers, especially on servers.

- **NeXT ends development of the NeXTSTEP operating system.**
- Intel begins shipping the 200-MHz Pentium Pro processor.
- **Silicon Graphics buys Cray Research**, at a cost of about US \$765 million.
- **America Online** agrees to bundle Netscape Navigator 2.0 with AOL's GNN online service. AOL users will also be able to select Netscape software to browse the web.
- Microsoft agrees to bundle AOL software with Windows 95. AOL agrees to make Microsoft Internet Explorer its built-in default browser.
- Microsoft releases Microsoft Internet Explorer 3.0.
- Microsoft unveils Microsoft Office 97 at Fall Comdex. Prices: standard edition US\$499 (upgrade US\$209), professional edition US\$599 (upgrade US\$309)

1996: Palm Pilot

- U.S. Robotics debuts the Palm Pilot.



well connected.¹



mostly business.²



fun and sporty.³



Esimene Palm

1996: Eestis internetipangad

- Kevadel **Foreksbank**: esimesed katsed.
- Suvel **Hoiupank**: täisvõimsusega.
- Hansapank esialgu kahtleb. Kuulujutuna kuuldud insider-tsitaat Jüri Mõisalt: “internet on seksuaalvähemustele”.

1997: Mac, MS, Gnu/Linux

- Microsoft ceases development of Windows NT for systems using PowerPC processors.
- Gilbert Amelio resigns as president, CEO, and chairman of Apple Computers. His severance package is about US\$7.5 million.
- **Steve Jobs** begins designing what would become the **iMac**.
- At Macworld Expo, **Steve Jobs announces an alliance with Microsoft**, including an investment of US\$150 million
- Miguel de Icaza starts writing **GNOME for GNU/Linux**, developed with the support of Red Hat Software, GNOME set out to provide similar desktop facilities to KDE, but using free software exclusively.

1997: Computer chess finally wins big

- **Deep Blue** wins the reigning World Champion in Chess, Garri Kasparov



1998: Netscape down, Mozilla born

- Netscape makes **source code for Netscape Communicator 5.0 browser available for free download on the Internet**
- **Free Mozilla browser project started.**
- Netscape lays off about 400 employees.



- The US Department of Justice and 20 state attorneys general file antitrust lawsuits against Microsoft, regarding its marketing of Internet Explorer.
- Microsoft applies for, and receives, a stay of the December 1997 court order allowing Windows 98 to ship with Internet Explorer 4.
- Microsoft ships Windows 98 to OEMs.
- America Online buys Netscape Communications for US\$4.2 billion in stock. Before, Netscape stock was priced around 20\$.

1998: iMac, MS super market cap, Red Hat

- Steve Jobs introduces the **iMac**: 233 MHz PowerPC G3 processor, 32 MB RAM, 4 GB hard disk, 24X CD-ROM, 15-inch monitor, 66-MHz system bus, for US\$1299.
- Intel announces the Pentium II **Xeon** processor.
- Microsoft becomes the world's most valuable company, at **US \$261.1 billion**.
- **Red Hat** Linux 5.2 is released. Red Hat emerges as a dominant Linux packaging-and-support company.



1999-2007: olulised asjad kümnendil

- **Vabavara** (GNU/Linux, Apache jne) muutus serverarvutitel (mitte laua-arvutitel) mainstream-tehnoloogiaks.
- **GNU/Linux** on olulisem, kui muud UNIX-id. Samas ei ole muutunud desktopil Windowsile tõsiseks konkurendiks.
- **3D graafikaprotsessorid** muutuvad oluliseks standard-kaubaartiklik.
- **Apple** läks üle **UNIXi**-põhisele opsüsteemile (**OS X**).
- **Microsoft** konvergeeris Windows 95/98/ME ja NT/2000: **Windows XP**, edasi **Vista**
- **Peer-to-peer** (P2P) tehnoloogial põhinevad **failivahetuse-süsteemid** ((Napster), (Morpheus), Kazaa, eDonkey, bittorrent jne) ja hiljem netitelefon (mh Skype)
- **Instant messengerid** muutuvad populaarseks
- **Google** muutub domineerivaks otsimootoriks + võrguteenuste pakkujaks
- **XML-põhised veebiteenused ärirakendustes**
- **CSS ja javascript** uuesti olulised brauseritehnoloogiad
- Apple liikumine meediamasinatele: **iPod, iPhone**

1990-2002: aktsiamull, 90-lõpu dot-com hype, crash!

- 1990-1996 kasvas USA aktsiaturg (nii DOW kui NASDAQ indeksid) palju kiiremini, kui eelmistel kümnenditel.
- 1996 arvas Fed-i juht **Greenspan**, et kasv on olnud liiga kiire (“irrational exuberance” speech)
- 1990-lõpuaastatel kiirendas **interneti muutumine mainstream-tehnoloogiaks** eriti järsult aktsiahindade tõusu.
- Tekkis palju firmasid, kes ei andnud üldse kasumit, ainult kulutasid raha, kuid mille aktsiaid osteti tohutu hinnaga.
- See andis hoogu ka nende firmade hinna kasvule, kes kasumit tekitasid.
- 2000 aasta alguses oli NASDAQ index veidi üle **4500**. 2002 sügis oli see **1139**!
- 2000-2002 olid nii NASDAQ kui DOW pidevalt langenud.
- Analoogia eestis: **börsimull 1997**
- 2003: börsilangus lõppes, algas harilik kasv

Internet Stocks

- Example of IPO craze.
 - IPOs issued Thursday, 10/12/98

Offering Friday's

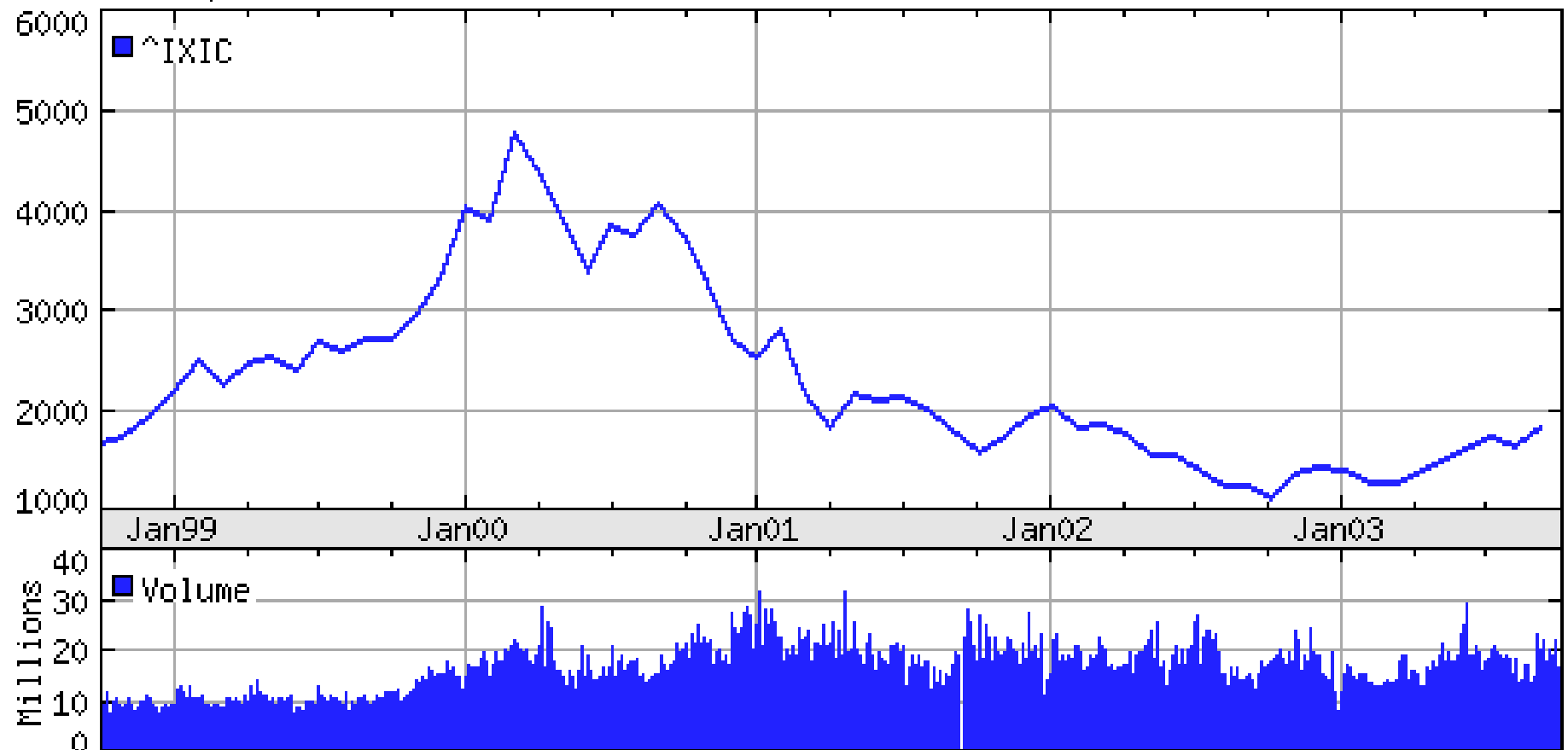
	<u>Price</u>	<u>Close</u>
theGlobe.com	\$ 9.00	\$ 63.00
EarthWeb	\$ 14.00	\$ 67.00

theGlobe Web site now:

“In 1995, theglobe.com confirmed the Internet's power to connect people worlds apart. Unfortunately, after six amazing years, theglobe.com closed its doors on August 15, 2001, though our award-winning games properties remain available at the links below.”

Nasdaq:1999-2003 sügis

NAS/NMS COMPOSITE
as of 29-Sep-2003

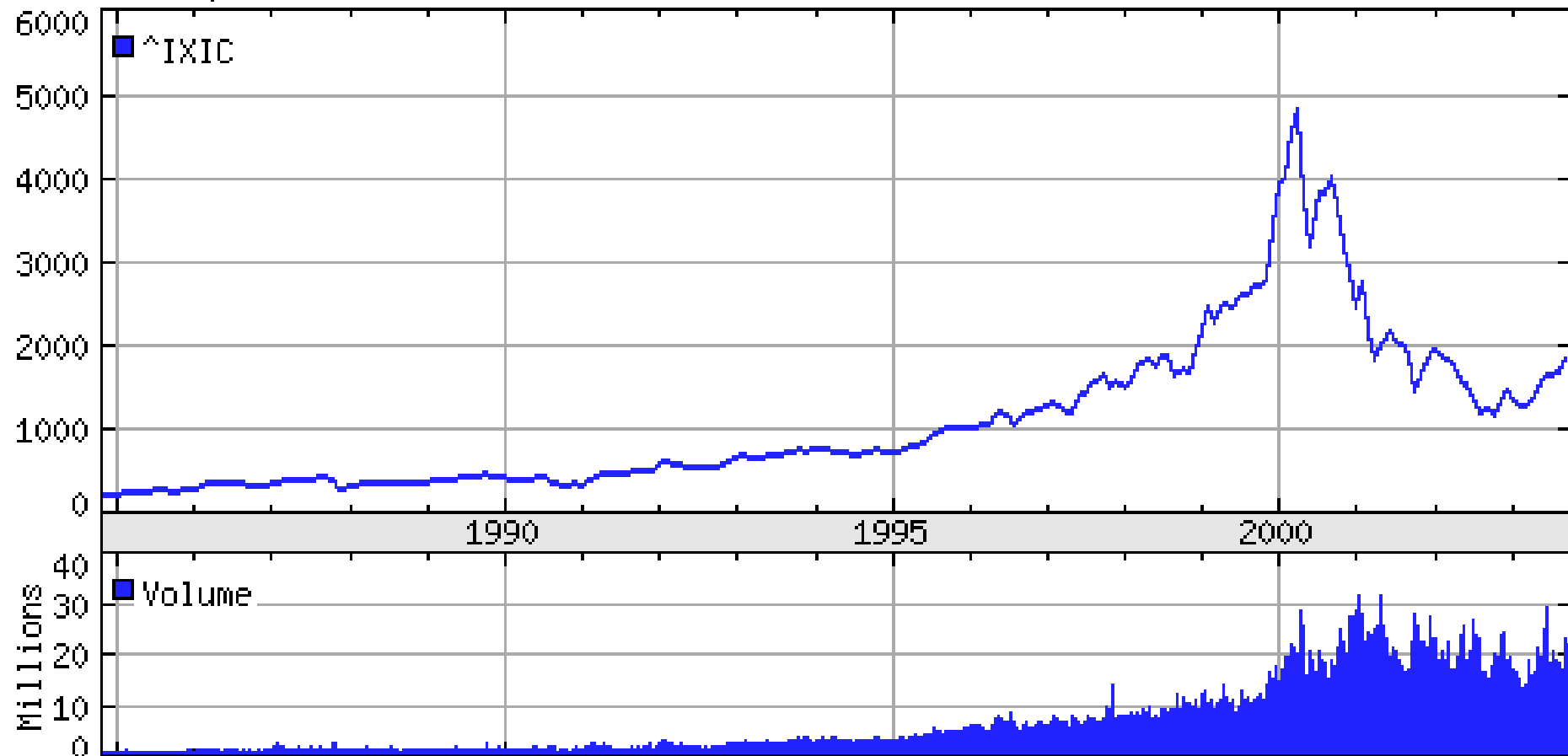


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Nasdaq longer period:1985-2003 sügis

NAS/NMS COMPOSITE
as of 29-Sep-2003

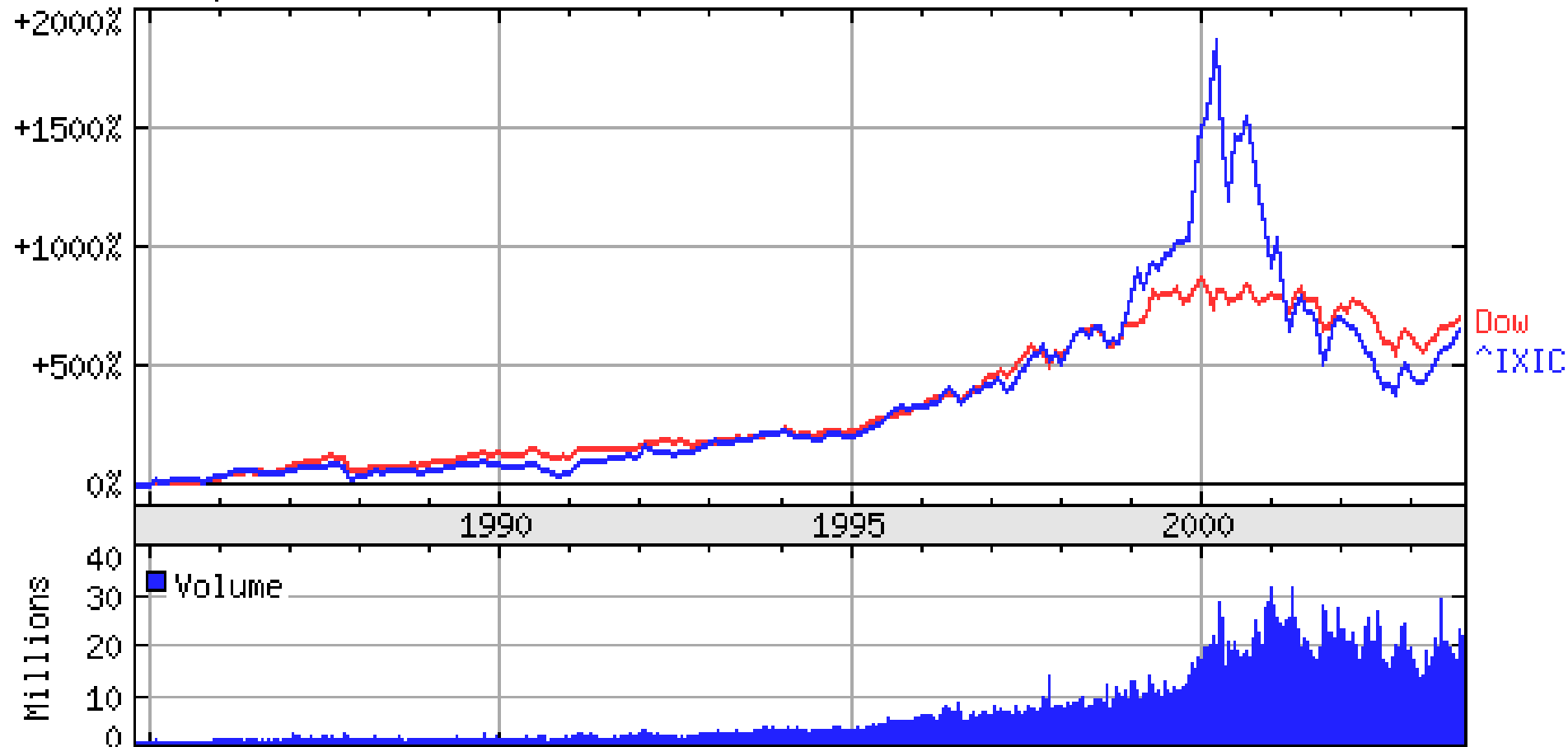


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Nasdaq ja Dow Jones: 1985-2003 sügis

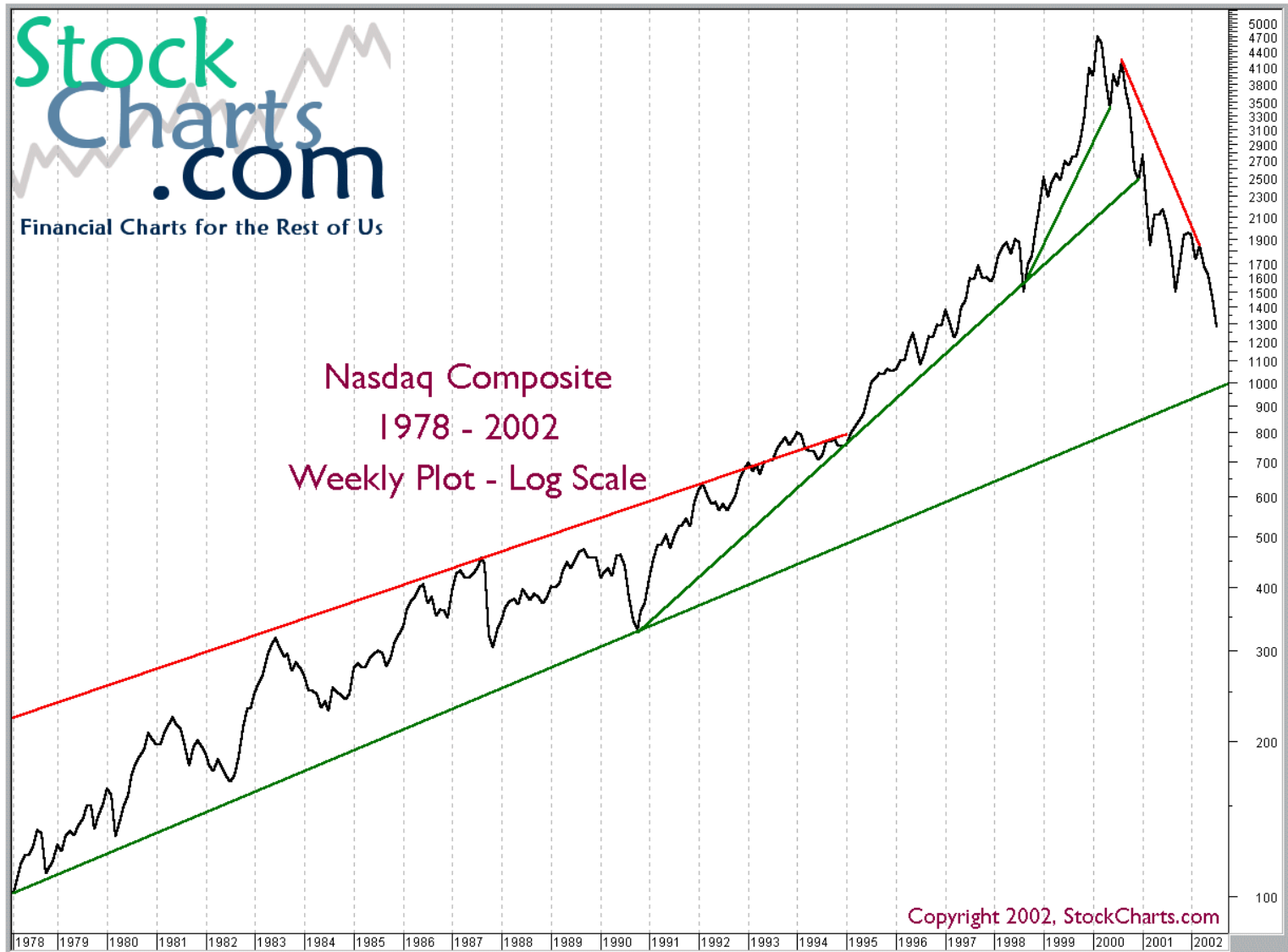
DJ INDU AVERAGE (DOW JONES & CO)
as of 29-Sep-2003



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Nasdaq: 1978-2002, weekly plot, logarithmic



“Aktsiamullide” ajaloost

- **Interneti-aktsiamull 1995-2001 ei ole esimene omataoline**
- **Kolm põhi-mullitüüpi:**
 - **Väikese kasutusväärtusega asjade üleväärtustamine** investeringutena (tulip mania in Holland 1630, Japanese real estate stocks in 1980-s)
 - **Suure kasutusväärtusega asjade firmadesse üleinvesteerimine** (railroad stocks 1800, internet and IT stocks in 1995-2001)
 - **Üleüldine firmade (aktsiate) üleväärtustamine** (before great depression in 1930-s, stock market in general 1995-2001, Eesti börsimull 1997)
- **Interneti laia levikuga sarnane näide: 19 sajandi algus: raudtee-buum:**
 - Raudtee muutis majandust tervikuna palju efektiivsemaks
 - Raudtee algusaegadel tekkis kiiresti palju-palju raudteefirmasid
 - Enamus raudteefirmasid pankrotistus
 - Väike hulk järgijäänud raudteefirmasid muutus suurteks firmadeks

1929 crash and the great depression: Dow Jones

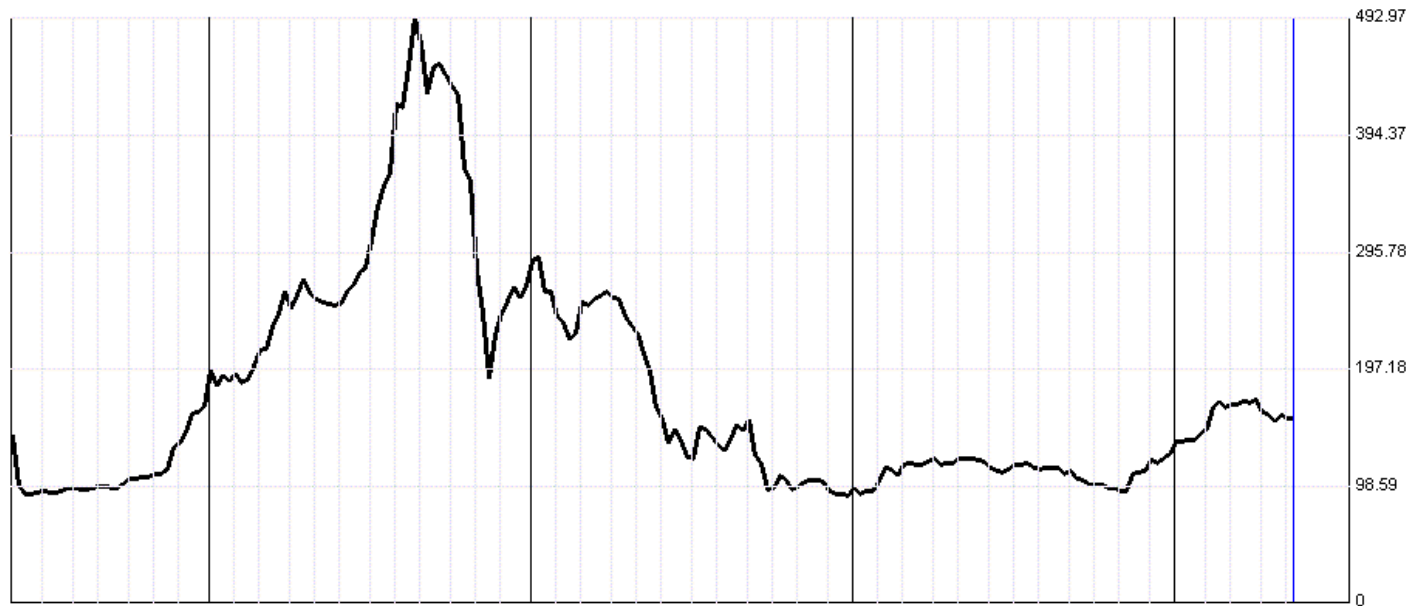


Talse 1999-2001: börsimull eestis aastal 1997

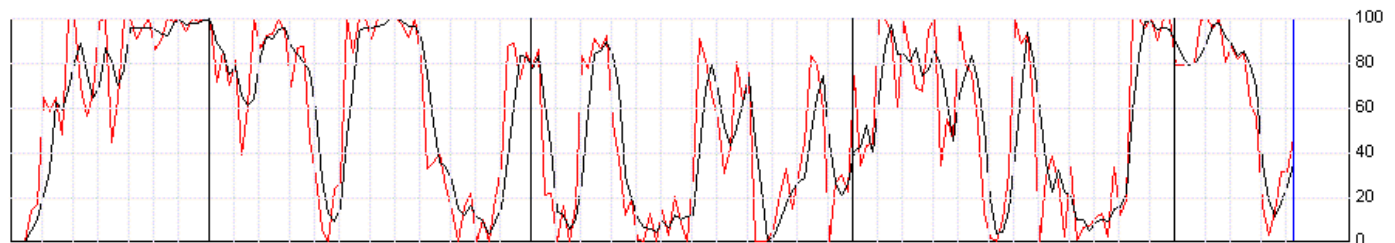


TSE TALSE

Week: 2000.5.8
Open: ??
Cls: 155.76
Min: 154.60
Max: 154.60
Avg: 154.60
Chng: ??
Vol: 1

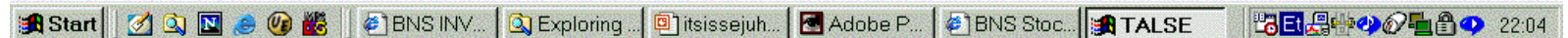


J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M



TALSE From: 1900.1.3 To: 2000.5.9 Zoom: << + - >>

Warning: AppletWindow



n on

Japanese Real Estate, 1955-90

- Real estate values **increased 75 times.**
- In 1990 real estate was valued at nearly \$20 trillion.
- 20% of world's wealth.
- **5 times the value of all US property.**

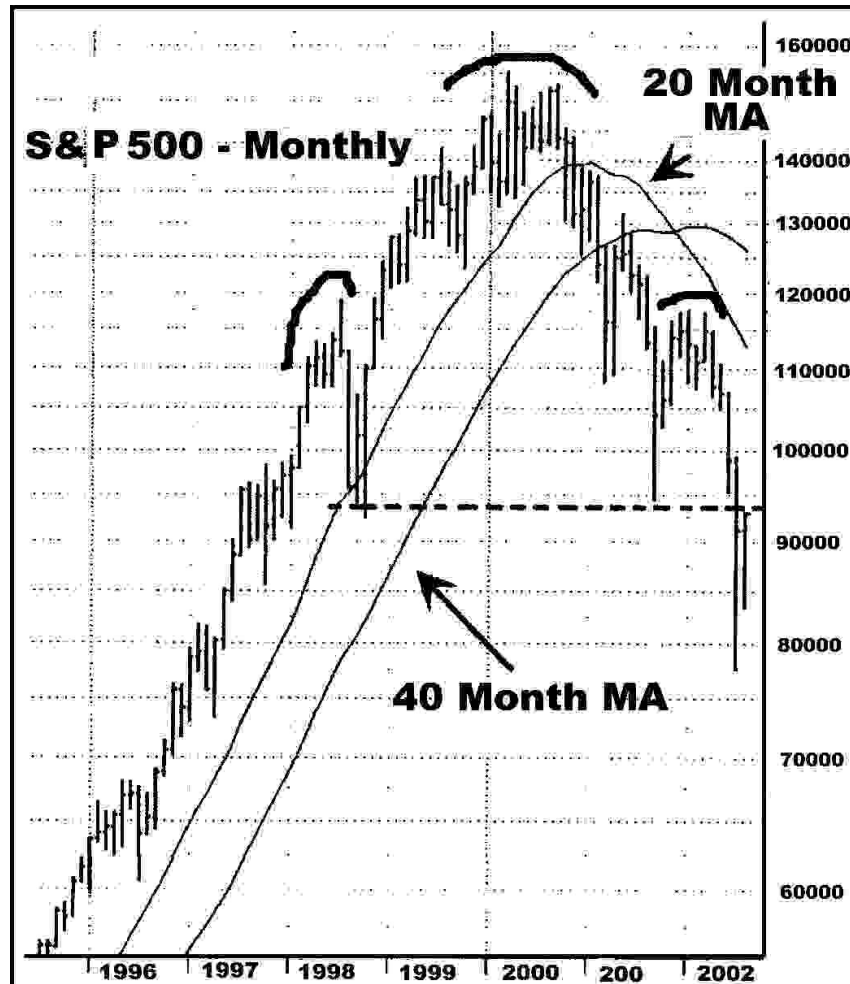
Japanese Stocks, 1955-90

- Prices **increased 100 times**.
- Japanese stocks accounted for **45% of the value of world's equity market**.
- Japanese stocks were valued at 1.5 times the value of all US equities.
- Market price-to-earnings ratio was 60.

Lai S&P indeks logaritmilisel skaalal kuni 2000



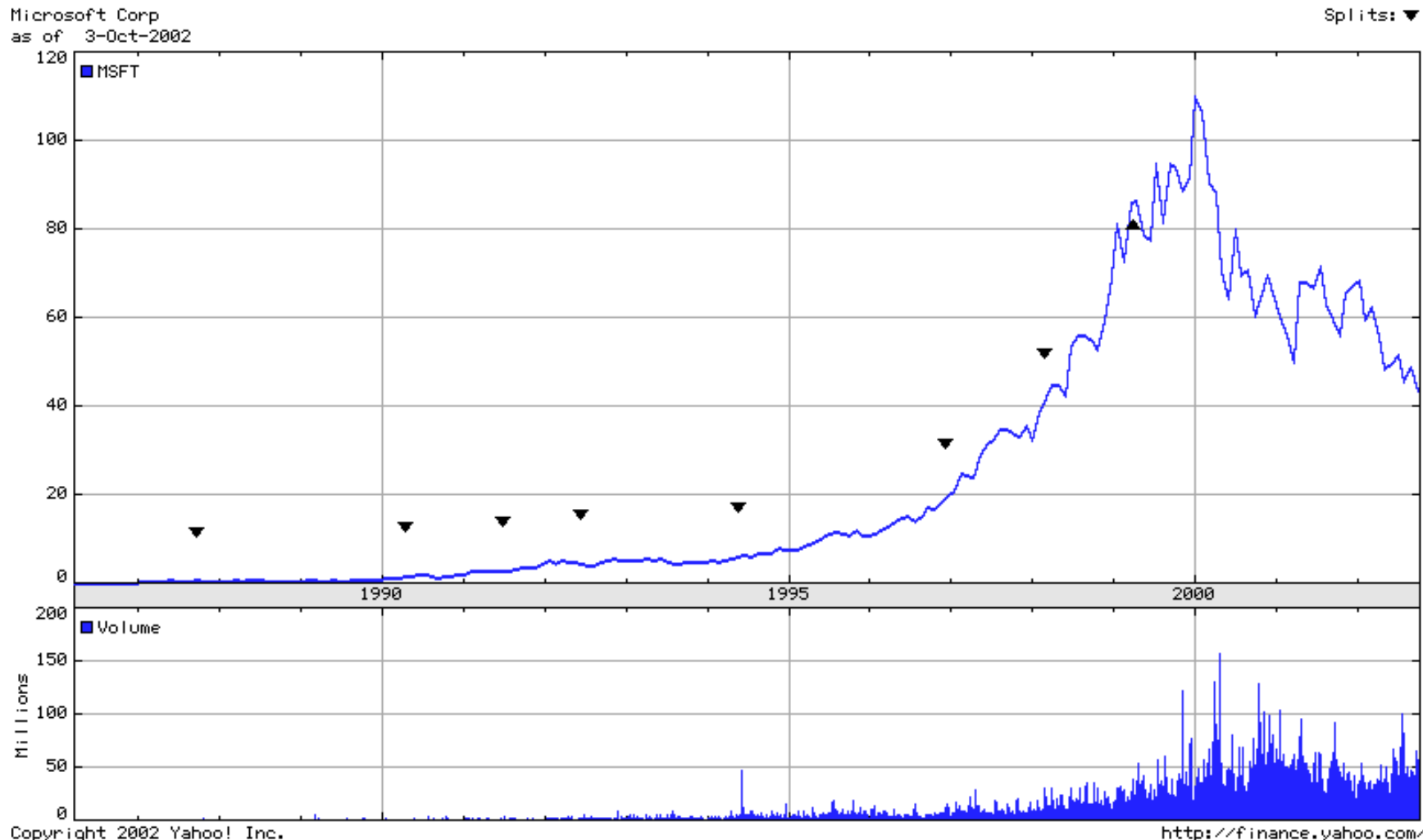
Lai S&P indeks 1996-2002: head & shoulders



Courtesy of Richard Russell's Dow Theory Letters
PO.Box 1759, La Jolla, CA, 92038

Microsoft

- Market cap: \$ 235.4 B, veidi allpool General electricut.

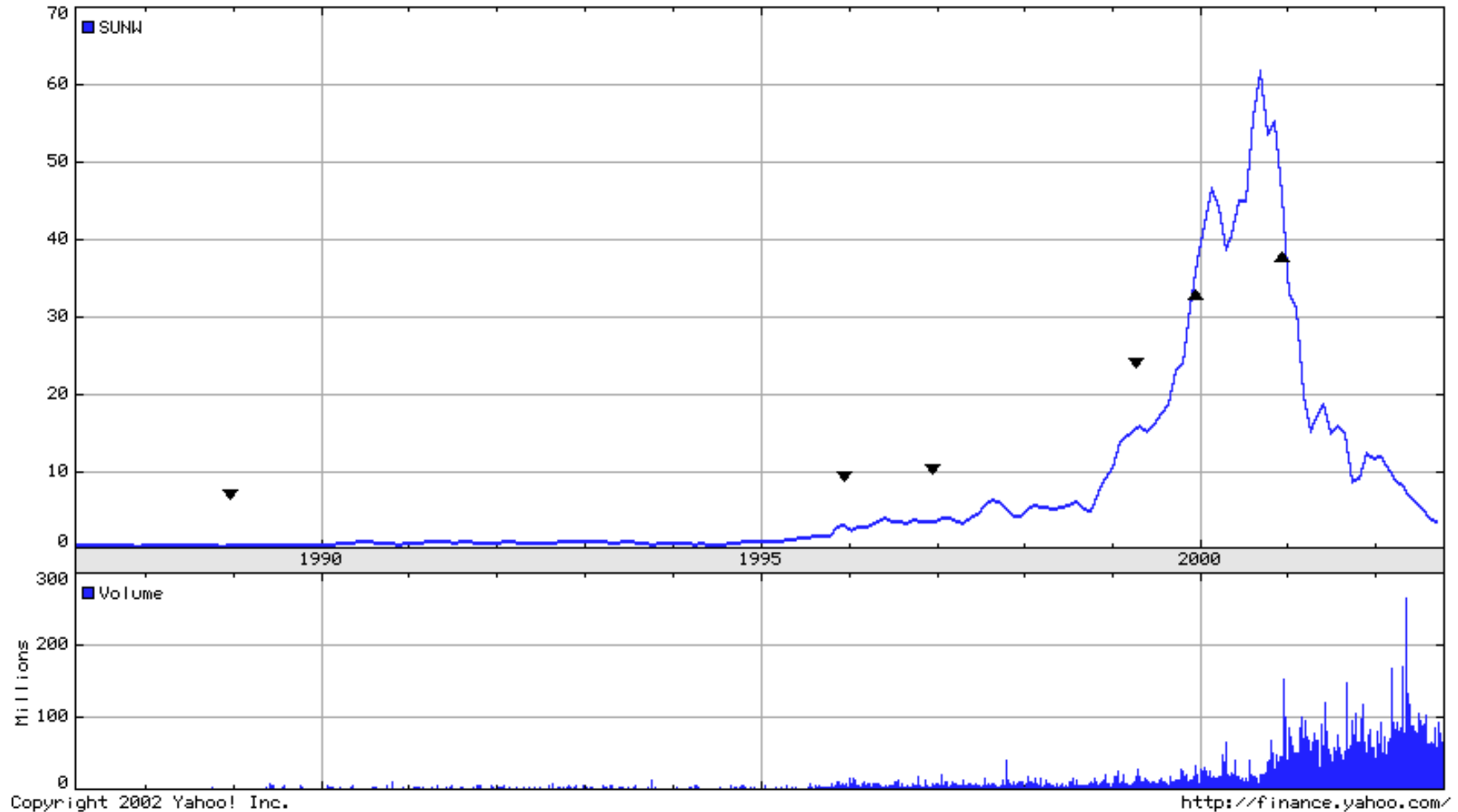


Sun Microsystems: 1987-2002 sügis. Aug

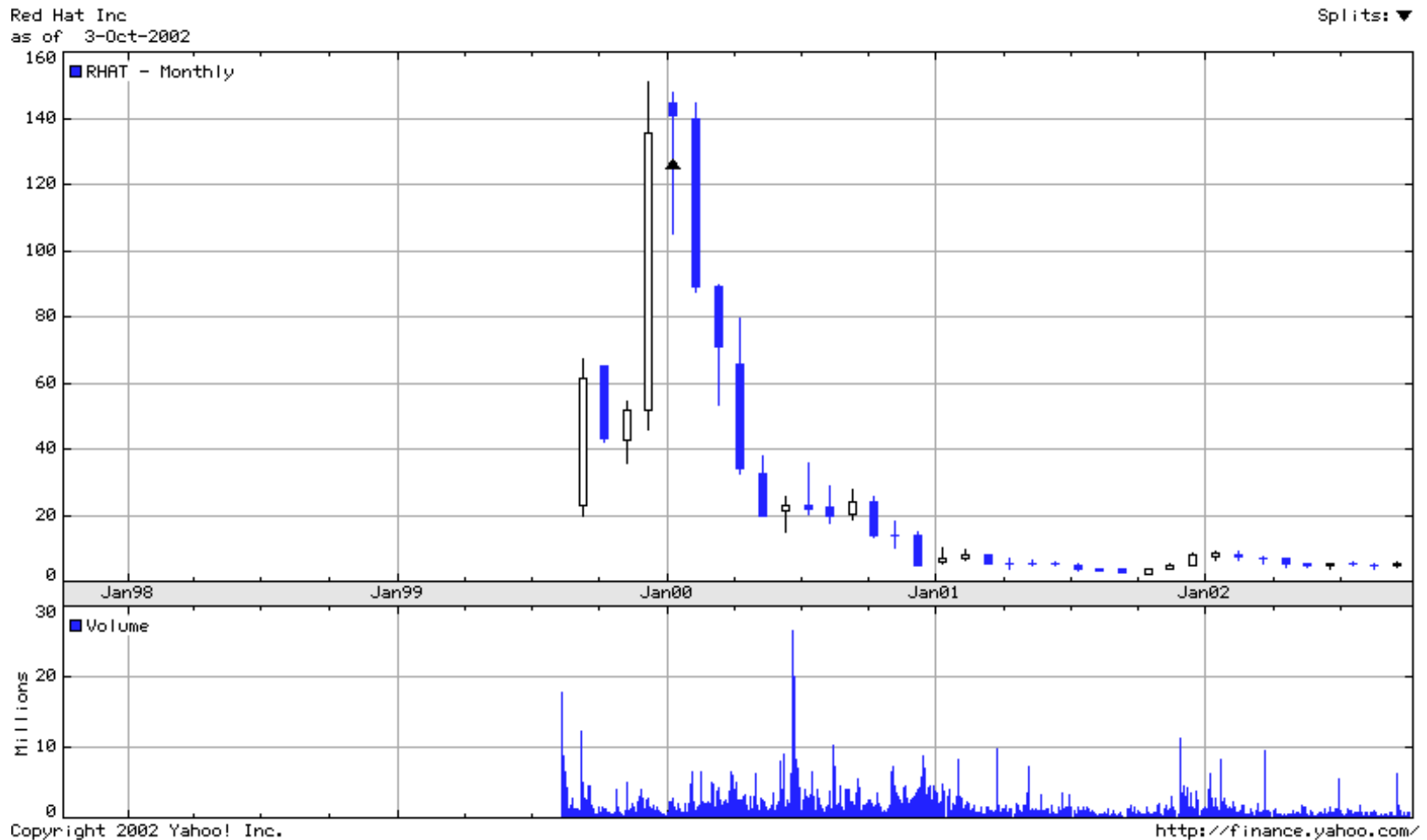
2003: ca 3

Sun Microsystems Inc
as of 3-Oct-2002

Splits: ▼



Red hat: Linuxi paketeerija ja toetusepakkuja

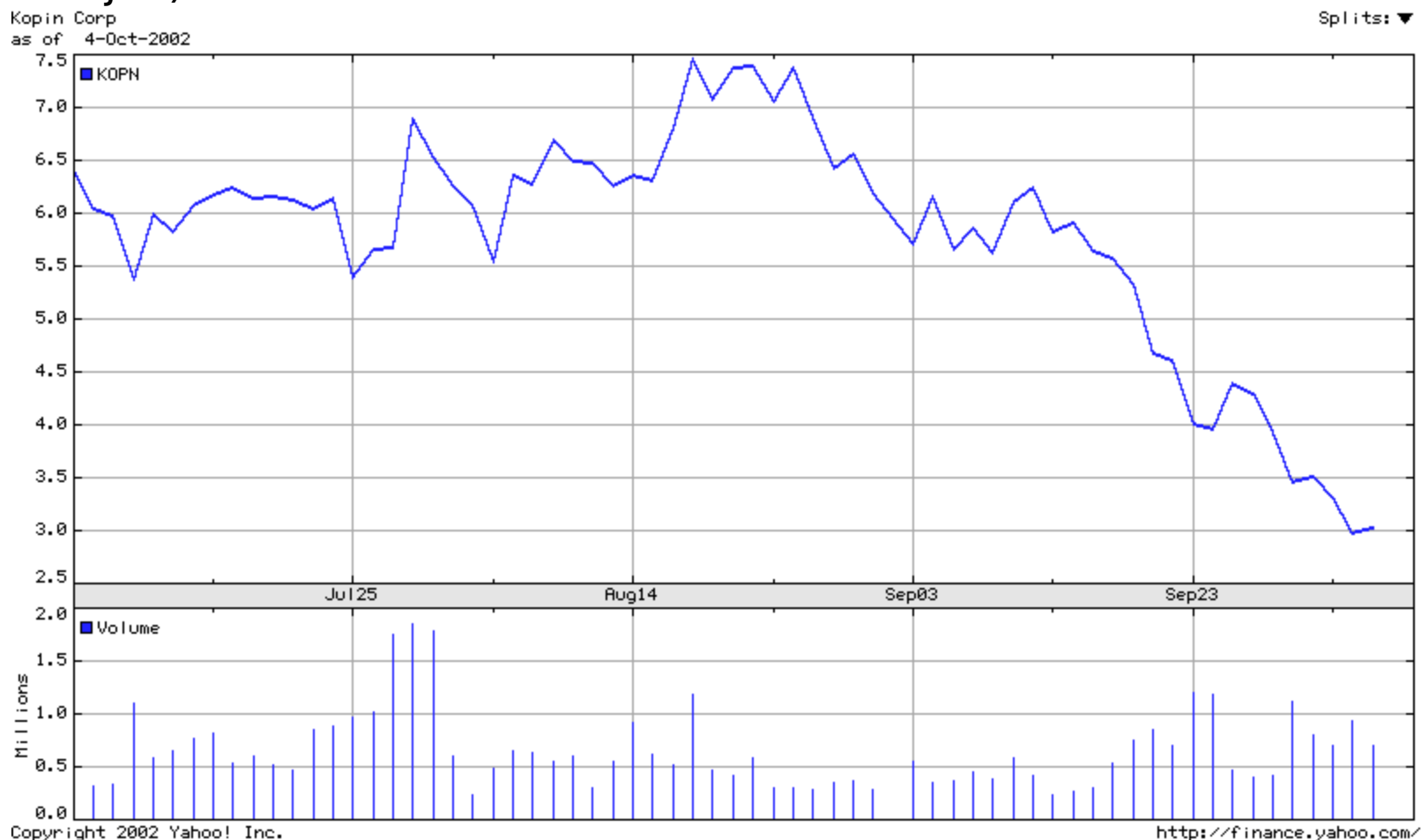


Red hat: 1-7 oct 2002 (in autumn 2003 again ca 9.5)



Kopin corp 3 kuud 2002: innovaatiline elektroonikafirma (autumn 2003: ca 7)

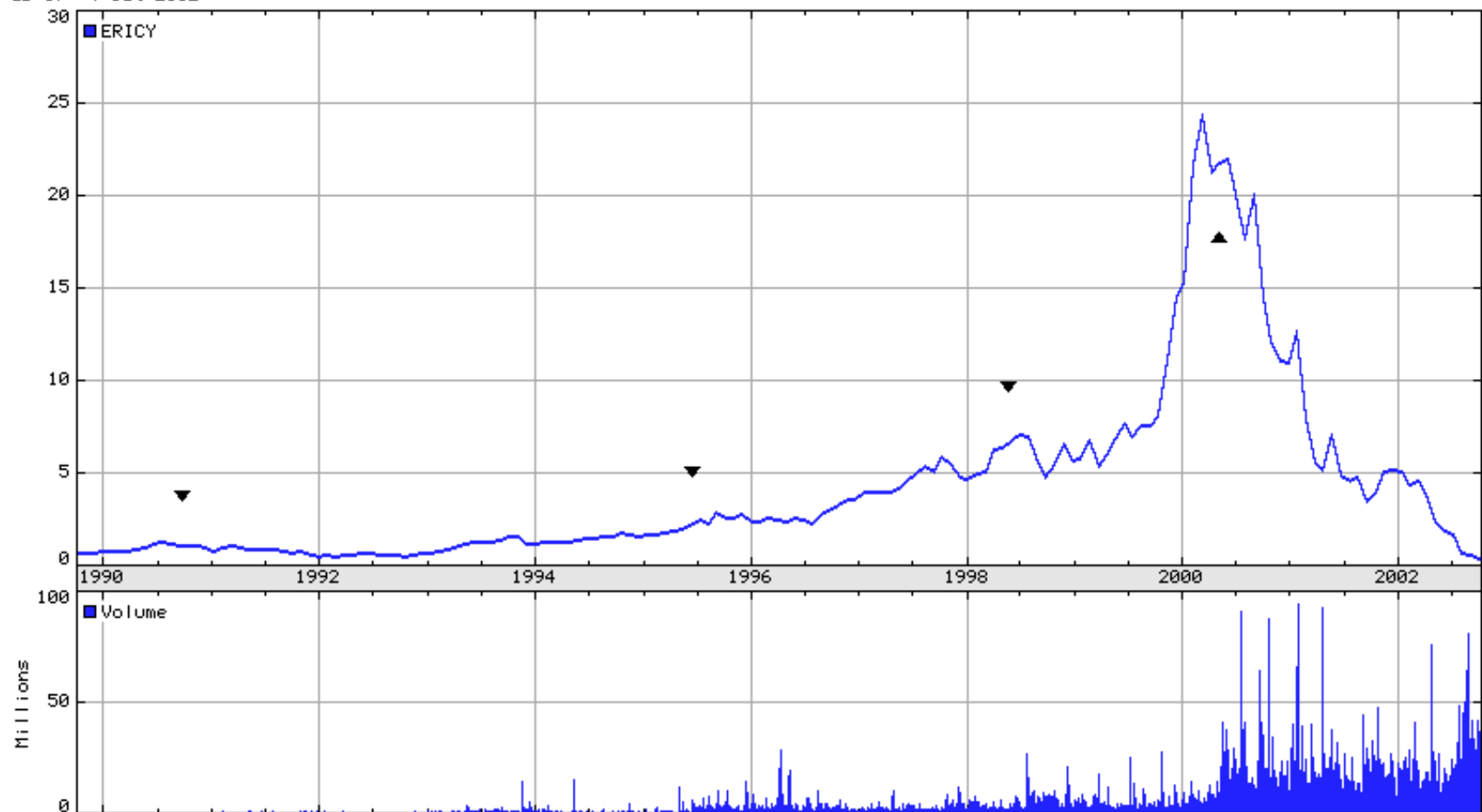
- KOPN: Toodab mh mainstream-**mikrodisplaysid** (mobiilides jne)



Ericsson: 2002 oct: 0.41, 1980 keskpaiga hinnatase

Ericsson, Telefonab. L M AB
as of 4-Oct-2002

Splits: ▼



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Vana majandus: General electric 1960-2002 sügis

■ Market cap: \$ 238.9 B

